Environmental Science

Environmental Science ESCI 1 ESCI D001.02 CRN: 41030
Lecture: T, TH 1:30 - 3:20 pm (APRIL 9 - JUNE 25) Rm: KC113
Final assessment: TUESDAY, June 25 1:45 – 3:45 PM

Neela Srinivasan **Spring Quarter 2019** 4.0 Units

DE ANZA COLLEGE, DIVISION OF BIOLOGICAL, HEALTH & ENVIRONMENTAL SCIENCES
ENVIRONMENTAL STUDIES DEPARTMENT, KIRSCH CENTER FOR ENVIRONMENTAL STUDIES (KCES)

DESCRIPTION

An introduction to environmental science as a branch of the sciences and its relation to the scientific field including the scientific method. Review of the principles, concepts and terminology of the environmental sciences and ecological literacy including restoration ecology, landscape ecology, sustainable studies and ecosystem management. Agenda 21 and other environmental indicator tools as they relate to human use of the earth's systems including the hydrosphere, atmosphere, lithosphere and biosphere and the impact on cultural, ethnic and gender groups will be explored.

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STUDENT LEARNING OUTCOMES

SLO #1: Utilize the scientific method to demonstrate role of scientist and public to determine a strategy to create sustainable society using scientific principles.
SLO #2: Utilize the environmental method to demonstrate role of scientist and public to determine a strategy to create a sustainable society using scientific principles.

OBJECTIVES

After completing this course you should be able to:

1. Help ***save this great planet and the Earth's remaining intact ecosystems!***
2. Understand ***environmental science*** as a branch of the sciences and its relation to other scientific disciplines
3. Understand ***ecological concepts and vocabulary***
4. Apply ***ecological literacy*** to modern life and a technologically based society
5. Understand the value and limits of the ***world's natural resources***
6. Understand the ***environmental indicators*** used to assess current trends in our environment
7. Use the ***environmental method as a problem-solving tool*** to develop solutions to the problems created by overuse of the world's resources
8. Examine ***worldwide*** strategies developed to address global environmental issues

RECOMMENDED TEXTBOOK

Wright, R.T. & Boorse D. F., 2013, *Environmental Science: Toward a Sustainable Future,* **De Anza Custom Edition,** Prentice Hall OR 12th Edition, OR 13th Edition (ISBN 0321811530) including eBook (available at Pearson.com)**.**

GENERAL INFORMATION:

1. This is a team-based and interactive course! Teamwork occurs every day in class with multiple in-class activities and assignments.
2. **Class Journal:** This is a separate notebook or binder section for the class that will contain entries for each class - lecture/video notes, in-class activities, and assigned readings. You will need to turn it in before the end of the quarter.
3. **Attendance:** Attend all classes and be on time! **SIGN IN and SIGN OUT each day.**
4. **Missed classes:** If you miss a class, it is your responsibility to email me for a make-up, then look at the lecture slides and videos etc. in emails, do the in-class activities and enter them in your journal. Mark the entry as "MAKE UP". No penalties for a maximum of two missed classes. All other missed classes will be graded at 60%.
5. **Add/Drop/Withdraw:** It is your responsibility to do these before the deadlines set by the College.
6. **Class Behavior:** Students are expected to exhibit proper classroom etiquette, including:
   6.1. Mobile devices can only be used for class related work. Disruptive/unethical student behavior will result in disciplinary actions. See http://www.deanza.edu/studenthandbook/academic-integrity.html

Need help? Visit De Anza's **Student Success Center** for peer tutoring and workshops!
The Student Success Center offers free tutoring for many De Anza classes.
Visit http://www.deanza.edu/studentsuccess for our hours and information about workshops, group, drop-in, weekly individual and online tutoring.

ASSIGNMENTS

1. **Individual Journal:** **DUE: Thursday of week before final.** Journal will be graded for completeness and quality (-2pts per entry for poor organization). Each day's entry must be organized as follows-
   1.1. A highlighted header line listing class#, date and topic. Attach any in-class handouts for the day.
   1.2. Notes on lectures and videos presented by me or your classmates in class.
   1.3. All completed in-class activities. If you cannot finish the activity in class, you need to finish it at home.
   1.4. Journal entries for missed classes will receive 60% credit. Two missed classes allowed with full credit.
2. **Quarterly Quizzes:** Throughout the quarter there will be 3 quizzes that will cover all material between quizzes only. All material is fair game and it is open journal. Meaning you can ONLY use your journal. This will encourage you to take really good notes in your journal and stay organized. There will be a series of short answer questions. No Scantrons needed.
3. **Team Presentations Mid-term and Final:** Guidelines on pages 5 and 6
   3.1. **Individual Summary (10 pts) : DUE one week before first day of presentation**: Each ***team member*** will turn in a 1-2 page summary for *their* portion of research, according to guidelines provided**.**
   3.2. **Slides (40 pts): DUE ON FIRST DAY of presentation for ALL teams:** Each team will develop and present a 15-20 minute presentation on ONE selected topic according to guidelines provided.
4. **Final Assessment:** **Tuesday, June 25, 1:45 – 3:45pm**

POINTS BREAKDOWN

Journal (20 x 5pts)	100
3 Quizzes (20 pts each)	60
Mid-term Team Presentation	50
Final Team Presentation	50
Final Assessment	40
Total	300 points

Grading Scale:

A	90 - 100 %
B	80 – 89 %
C	70 – 79 %
D	55 – 69 %
F	54 % & below

"When we try to pick out anything by itself, we find it hitched to everything else in this universe." - John Muir

LECTURE TOPICS AND IN-CLASS ACTIVITIES

SCHEDULE: ***SUBJECT TO REVISION***

Class 1 Introductions & Welcome!

Apr 9 Review of Course
- **Slides:** Global challenges & Transition to a Sustainable Future
- **Activity 1:** Kirsch Center and ESA Tour
- **Activity 2:** Greensheet Review and due dates

Class 2 **Apr 11**
- **Slides:** Global challenges & Transition to a sustainable future continued
- **Activity:** 1. Form teams (4-6 students per team)
  2. Kirsch Center Treasure Hunt
  3. Cheeseman Environmental Study Area (ESA)

Class 3 **Apr 16**
- **Film:** The Story of Stuff
- **Activity 1:** Cheeseman Environmental Study Area (ESA) finish
- **Activity 2:** Unifying Themes of Environmental Science

Class 4 **Apr 18**
- **Slides:** What is Science? What is Environmental Science?
- **Activity:** Case Study of Science Activity
- **Film:** Environmental Movement: "Pesticides-DDT, Rachel Carson: Silent Spring"

Class 5 **Apr 23**
- **Slides:** Ecosystems: Introduction to Ecology & Ecosystems
- **Activity:** The Structure of Ecosystems

Class 6 **Apr 25**
- **Slides:** Ecosystems: Energy and Nutrient Flow - Foodwebs
- **Film:** How Wolves Change Rivers
- **Activity 1, 2, 3: During Lecture (Photosynthesis, Food Web, Biomass)**
- **Activity 4:** Mid-term Presentation Meeting 1: Choose one Aquatic System or Biome
  Due from each team: Presentation Topic, Team member names
  Due from each student: List of sources, sub-topics, half page writeup on sub-topics

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Class 7 **Apr 30**
- **Slides:** Ecosystems: Energy and Nutrient Flow - Biogeocycles
- **Film:** How Nature Works: Grasslands
- **Activity:** Questions on Film

Class 8 **May 2**
- **QUIZ 1**
- **Activity:** Ecosystem Services
- **Activity:** Can Ecosystems be Restored?
  3 Challenges and 3 Successes in Environmental Science
  - Increasing Population, Decline of Ecosystems, Global Climate Change
  - Tule Elk Reintroduction, Peregrine Falcon Conservation, Salt Pond Restoration

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Class 9 **May 7**
- **Slides:** Evolution and Biodiversity
- **Activity:** Mid-term Presentation Meeting 2
- **DUE**: Mid-term Presentation Summary

Class 10 **May 9**
- **Slides:** Citizen Science
- **Activity:** Citizen Science – ESA BioBlitz

Class 11 12	**DUE:**	**Team Presentation 1: Biomes**
May 14,16	**Activity:**	Each Student for journal: 1) Self evaluation; 2) Team evaluation; 3) Summary from other team's presentation; 4) question to another team

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Class 13	**Slides:**	Biodiversity Crisis: Global hotspots, Effect of Climate Change on Biodiversity
May 21	**Activity:**	Biodiversity of California
	Activity:	Species Ecological Niche
Class 14	**Slides:**	Landscape Connectivity: Coyote Valley Safe Passage – A Case Study
May 23	**Film:**	Highway Wilding
	Activity:	Coyote Valley Camera Surveillance Data

Class 15		**QUIZ 2**
May 28	**Demo:**	How to choose a peer-reviewed journal article (ProQuest, Google Scholar)
	Activity:	Final Presentation, Meeting 1: Determine topic and list of sub-topics DUE (each team): List of sources for your sub-topics, including at least 1 journal article DUE (each student): One-page writeup on peer-reviewed journal article
Class 16	**Slides:**	Biogeochemical Cycles: Hydrological Cycle
May 30	**Video:**	California Water Story or State of Thirst: California's Water Future
	Activity:	Santa Clara County Watershed mapping

Class 17	**Slides:**	Biogeochemical Cycles: The Carbon Cycle & Climate Change
June 4	**Film:**	Climate Change: Lines of Evidence
Class 18	**Activity:**	AB 32: California Global Warming Solutions Act of 2006
June 6		https://www.arb.ca.gov/cc/ghgsectors/ghgsectors.htm

Class 19	**Film:**	Renewable Resources and Sustainable Society
June 11	**Activity:**	TBA
	DUE:	Final Presentation Summary
Class 20		**QUIZ 3**
June 13	**Activity:**	Final Presentation, Meeting 2

Class 21,22	**DUE:**	**Team Project Presentation 2**
June 18,20	**Activity:**	Each Student for journal: 1) Self evaluation; 2) Team evaluation; 3) Summary from other team's presentation; 4) question to another team
	DUE:	**JOURNALS DUE NO LATE JOURNALS ACCEPTED!**

Class 23 **FINAL:** **Tuesday, June 25, 1:45 – 3:45pm**

Team Presentation Guidelines

Mid-term Presentation Topic:

- Choose ONE Aquatic System OR Terrestrial Biome.

Required Content:

- Clearly state the name of the ecosystem
- Describe the abiotic structure of the ecosystem, the geographical regions where it occurs
- Describe biotic structure of the ecosystem, including plant communities, food web, symbiotic relationships
- Select a few species to describe in detail, how they fit in the food web (including trophic category)
- Describe the ecosystem services that the ecosystem offers
- Describe the conservation issues regarding the ecosystem – pollution, habitat loss, etc.
- Describe what is being done to help its conservation/restoration, include organizations (govt/private/ngo)
- Describe what we in the class can do to help
- Add any other aspects of interest to you

Final Presentation Topics: Suggested themes –

- Renewable Energy (focus on one type of renewable energy)
- Energy Conservation (e.g., Green building)
- Pollution prevention (e.g., air pollution, water pollution, plastic pollution, green chemistry)
- Waste Management (e.g., waste water treatment, solid waste management)
- Environmental Law/s; Sustainability management plans
- Transportation (in relation to sustainable cities, global warming)
- Soil conservation, Sustainable agriculture, Food systems and their sustainability
- Or, any relevant topic of your team's choice

Required Content:

- Why did you choose this topic?
- The science behind the topic
- Environmental impacts, socio-economic and environmental justice issues
- Environmental laws relating to the topic
- Organizations (e.g., government/private enterprise/individual responsibilities for waste management)
- 1 or 2 examples and current events related to the topic
- Job opportunities (types of jobs at various levels, locations, educational requirements)
- Critical thinking – Pros and Cons of technology

Individual Summary:

- ***Individual Summary* –** 1-2 pages long, double spaced, size 12 font, normal margins
- ***Sources* –** Each team member must research **at least TWO sources**

Slides/Oration:

- Each slide must have the initials of the team member responsible for its content
- ***Title slide* –** Team topic and team member names
- ***Fonts* –** Font size must be 32 or higher; Well contrasted from background; Easily readable from the back of the class.
- ***Media* –** Include relevant pictures, charts, etc. to explain your sub-topic; Videos can be at most 2 min.
- ***Oration* –** Speak loudly and clearly so everyone can hear you; Practice presenting to your group
- ***Use your own words* –** No cut & paste from websites; quotations okay and MUST be in quotation marks.
- ***Time* –** 15-20min per team; Make sure each member's presentation is neither too short nor too long

Sources (References):

- Sources must be scholarly and/or peer reviewed
- Cite all sources at the end (use numbers in the text or slides to match numbered citations at end)
- Cite sources in MLA Style (8th edition)
- See: https://www.deanza.edu/library/citingsources.html for more information

Inappropriate Sources

- *Personal websites, Class websites, Travel websites, websites meant for K-12 students*
- Examples: Earth Eclipse (personal website), Blueplanet Biomes (class website), UCMP Berkeley (class website), Conserve-energy-future.com (personal website), Bioexpedition.com w3.marietta.edu/… (class website), FactsAndDetails.com (personal website)

Appropriate Sources

- *Peer reviewed journal articles:* available on De Anza library's website and arXiv.org
- *Reports and web pages that are meant to educate the public*, from Government agencies, University departments, and Science-based organizations (e.g., US Fish and Wildlife Service, California Department of Fish and Wildlife, Center for Biological Diversity, NASA, NOAA, Rainforest Alliance, IUCN, Ocean Conservancy)
  - E.g., Atlas of the Biodiversity of California, Safe Passage for Coyote Valley (available at SRC)
- *Books, Videos:* De Anza Library's website - (see eBooks, Films on Demand), arXiv.org
- *Investigative reports from newspapers/magazines/journals:* SJ Mercury News, Bay Nature magazine, Scientific American, Science, Nature, Conservation Biology, PLOS online science journal
- *Educational audio/video shows:* E.g., KQED Quest
- *Wikipedia:* Finally, you may use Wikipedia, but only as a launch pad for further scholarly research

Grading Key for each presentation

	None					All	Score
1. Addressed all required content	0	1	2	3	4	5	_____
2. Clear understanding of material, and fully prepared	0	1	2	3	4	5	_____
3. Slides were clean, easy to read, appropriate, with engaging graphics	0	1	2	3	4	5	_____
4. Engaged audience by speaking loudly, clearly, and used eye contact	0	1	2	3	4	5	_____
5. Relied mostly on memory, light use of notes and NOT reading slides	0	1	2	3	4	5	_____
6. Group adhered to the time frame	0	1	2	3	4	5	_____
7. Group members appeared to work well together	0	1	2	3	4	5	_____
8. Overall quality	0	1	2	3	4	5	_____
9. Individual Summary							_____ /10
						TOTAL	_____ /50